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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/508,367	01/03/2002	Jeremy Henley Burroughes	C1043/7022	8430

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1300 I STREET, NW  
WASHINGTON, DC 20005

EXAMINER
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TRINH, MICHAEL MANH

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/508,367

Applicant(s)

BURROUGHS ET AL.

Examiner

Michael Trinh

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 56-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 56-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.8.10
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2822

### DETAILED ACTION

\*\*\* This office action is in response to Applicant's amendment filed on November 03, 2003. Claims 1-55 were canceled. Claims 56-87 are pending, in which claims 64-87 have been newly added.

\*\*\* Claims 1-55 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention. Election (11/3/03) was made without traverse in Paper No. 13. Claims 1-55 were canceled by Applicant.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (c) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 56-69, 72-81, 84-87 are rejected under 35 U.S.C. 102(b) as being anticipated by Garten et al (Advanced Material, Vol 9, No 2, pp 127-131).

Garten et al teach a method for forming an organic electroluminescent device comprising depositing a first charge carrier injecting anode layer (ITO) for injecting charge carriers of a first polarity (pp 128, left column, second paragraph; pp 129, left column, bottom paragraph); depositing a light-emissive layer, single layer ("structure 5") or double layer ("structure 7") over the first charge injecting layer, the light emissive layer comprising a mixture of: a first component for accepting charge carriers of the first polarity from the first charge carrier injecting layer, a second component for accepting charge carriers of the opposite polarity from a second charge carrier injecting layer; and a third, organic light emissive component for generating light as a result of combination of charge carriers from the first and second components; at least one of the first, second, and third components forming a type II semiconductor interface with another of the first, second, and third components; wherein the single layer structure comprises a blend

Art Unit: 2822

of three components of PVK, SiPPV, and PBD, wherein as shown in Figure 3, the interface between any two of the three component materials of PVK, SiPPV, and PBD is a type II semiconductor interface, wherein, as described in page 128, left column to page 129, the luminescent chromophore (SiPPV, 5% weight) is blended in a transport matrix of PVK, wherein PVK acts as a hole transport material, PBD acts as an electron transporting material, and SiPPV acts as the active light emitting material (pages 130-131) wherein the blending includes a first organic light emissive component PVK and a second organic light emissive component of SiPPV; and depositing the second charge carrier injecting cathode layer (Al or Au) over the light emissive layer for injecting charge carriers of the opposite polarity (pp 128, left column, second paragraph; pp 129, left column, bottom paragraph). Re claims 57 and 61, wherein forming the "structure 5" or "structure 7" by blending the substances as to deposit a premixed solution (page 128, left column). Re claims 58 and 62, wherein solidification of the first charge carrier injecting layer inherently influence the phase structure separation of the light emissive layer deposited thereafter (pp 128, left column, second paragraph; pp 129); and Re claims 69 and 63, wherein the phase structure separation provides a greater concentration of one components near the first charge carrier injecting layer. Re claims 64-67, 75, 76-79, 87, wherein the third component and at least one of the first and second are provided as a copolymer (pp 128, right column; and left column, last paragraph; and page 129), or as a pendant group of polymer chain (Fig 1); and wherein the first, second and third components are provided as functional moieties of the same molecule (re claim 76) or single molecule (re claim 75, 87). Re claims 68-69, 80-81, wherein at least one of the first, second, and third component is conjugated polymer material (pp 128, left column, last paragraph), and wherein the components are provide as different molecules of PVK, SiPPV, and PBD (Fig 1; pp 128-129). Re claims 74 and 86, wherein the components are deposited from solution (pp 128, left column, last paragraph through page 129). Re claims 72 and 84, wherein the first charge carrier injecting anode layer of ITO has a work function of 4.8-5.2 eV (pp 129, left column, bottom paragraph) is thus greater than 4.3. eV as claimed. Re claims 73 and 85, wherein the second charge carrier injecting cathode layer has a work function of less than 3.5 eV (pp 129, right column, lines 1-15)

Art Unit: 2822

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 70-71,82-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garten et al (Advanced Material, Vol 9, No 2, pp 127-131) taken with Friend et al (6,429,601).

Garten et al teach a method for forming an organic electroluminescent device as applied to claims 56-69,72-81,84-87 above.

Garten lacks having at least one of the components of a polyfluorene (claims 70,82), or a copolymer comprising polyfluorene segments (claims 71,83).

However, Friend et al teaches (at col 5, lines 1-17) forming an electroluminescent device of an organic conjugated polymer material, wherein at least one of the components of the material includes PPV, PPV-derivative, and a polyfluorene and/or a co-polymer incorporating polyfluorene segments (col 5, lines 6-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the electroluminescent device of Garten et al by using at least one of the components of a polyfluorene or a copolymer comprising polyfluorene segments, as taught by Friend. This is because these organic light emitting material are alternative and art recognized equivalent for substitution in forming the organic light emitting polymer material.

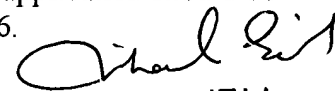
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-7



Michael Trinh  
Primary Examiner